



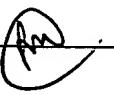
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/416,618	10/12/1999	ROBERT PAASCH	10980780-1	6379
22879	7590	10/21/2005	EXAMINER	
HEWLETT PACKARD COMPANY P O BOX 272400, 3404 E. HARMONY ROAD INTELLECTUAL PROPERTY ADMINISTRATION FORT COLLINS, CO 80527-2400				NGUYEN, LAM S
		ART UNIT		PAPER NUMBER
		2853		

DATE MAILED: 10/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	09/416,618	PAASCH, ROBERT 
	<b>Examiner</b>	<b>Art Unit</b>
	LAM S. NGUYEN	2853

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 02 August 2005.
- 2a) This action is FINAL.                            2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1,2,4-17,19-27 and 29-33 is/are pending in the application.
- 4a) Of the above claim(s) 17,19-22,26 and 27 is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1,2,4-16,23-25 and 29-33 is/are rejected.
- 7) Claim(s) \_\_\_\_\_ is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on 10 December 1999 is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
  1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                                                                               |                                                                             |
|-----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                                                   | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                                          | Paper No(s)/Mail Date: _____                                                |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>01/24/2005</u> | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
|                                                                                                                                               | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

Claims 17, 19-22, 26, and 27 are objected to because of the following informalities: As a result of being previously non-elected (submitted on 04/08/2005), the status of the claims should be indicated as “Withdrawn”. Appropriate correction is required.

### *Election/Restrictions*

Applicant's traverse (filed 08/02/2005) to the restriction requirement (mailed on 07/12/2005) have been fully considered and found persuasive. Therefore, the above restriction requirement has been withdrawn. As a result, claims 1-2, 4-16, 23-25, 29-33 will be considered as follows.

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 7, 23-24, 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naoki (JP 11129472) in view of Mansky et al. (US 6438497).

### **Referring to claims 7, 23, 29-32:**

Naoki discloses a side-shooting thermal inkjet printhead for an inkjet printing apparatus comprising:

a substrate (*FIG. 5, element 2*);

at least one thermal ink ejector/expulsion mechanism disposed on said substrate

(*FIG. 5, elements 21*),

an ink well defined proximate said ink expulsion mechanism and a nozzle formed as an egress from said ink well (*FIG. 5, elements 6 and 8*),

a pressure wave transducer disposed on said substrate at said ink well in a same plane as said ink expulsion mechanism (*FIG. 5, element 55*), and having a directional detection characteristic whereby a pressure wave, induced by a firing of said ink expulsion mechanism, traveling in a predetermined direction from said at least one ink ejector is preferentially detected (*Abstract and FIG. 5: The sensor 55 detects the pressure wave traveling from the chamber 6 to the chamber 8 due to the ink discharge*).

Naoki does not disclose wherein the pressure wave transducer is an interdigitated acoustic wave piezoelectric transducer and a second interdigitated pressure wave transducer disposed on said substrate and having a directional detection characteristic oriented such that a pressure wave traveling in a second direction different than said predetermined direction is preferentially detected (**Referring to claim 24**).

Mansky et al. teaches that a pair of acoustic wave sensors having an interdigitated structure formed on a piezoelectric material (*FIG. 17A-B, element 172, 176*), beside measuring transmission of acoustic energy traveling from opposite direction, can measure the dielectric constant and the conductivity of the material carrying the acoustic energy (*column 37, lines 2-15*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to replace the wave sensor disclosed by Naoki by an interdigitated wave sensor as disclosed by Mansky et al. The motivation for doing so would have been to obtain the

advantage of the interdigitated wave sensor that can measure the dielectric constant and the conductivity of the material carrying the acoustic energy as taught by Mansky et al. (*column 37, lines 2-15*).

2. Claims 1-2, 4-6, 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Naoki (JP 11129472) in view of Mansky et al. (US 6438497) and Bares et al. (US 5023625).

Naoki et al., as modified, discloses the claimed invention as discussed above except said nozzle is formed in a member opposing said ink expulsion mechanism, a barrier layer formed on said substrate, a cover plate having a nozzle therein formed on said barrier layer and positioned such that said nozzle is aligned with said ink expulsion mechanism, said substrate, barrier and cover plate defining said ink well. (Note:

Bares et al. discloses a top-shooting thermal inkjet printhead having a nozzle (*FIG. 5, element 17*) formed in a member opposing an ink expulsion mechanism (*FIG. 5, element 11*), a barrier layer (*FIG. 5, element 12*) formed on a substrate (*FIG. 5, element 15*), a cover plate (*FIG. 5, element 16*) having a nozzle therein formed on said barrier layer and positioned such that said nozzle is aligned with said ink expulsion mechanism, said substrate, barrier and cover plate defining an ink well (*FIG. 5, element 14*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to replace the side-shooting printhead structure disclosed by Naoki et al., as modified, by the top-shooting printhead structure including the barrier layer, the cover plate comprising the nozzle opposed and aligned with the ink expulsion mechanism as disclosed by Bares et al. since both structures are well known in the art as alternative common technique for designing a thermal ink jet printhead.

3. Claims 10-16, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeshi (JP 09201967) in view of Bares et al. (US 5023625).

Takeshi et al. discloses a thermal side-shooting inkjet printhead apparatus, comprising:

a substrate (*FIG. 4, element 13*);  
an ink expulsion mechanism (*FIG. 4, element 19-20*) formed on said substrate;  
a pressure wave sensor mechanism including piezoelectric material formed on said substrate (*FIG. 4, element 40 and paragraph [0042]*: *The piezoelectric sensor 40 is attached on the inferior surface of the substrate 13*) that is capable of detecting a pressure wave of a first/second non-zero magnitude indicative of when said nozzle is clogged/unclogged or the conditions including dry-fire and no-fire (*paragraph [Means for Solving the Problem], [0035], [0045]*: *The acoustic signal detection means detects the pressure acoustic signal indicating the normal/abnormal discharge condition such as the ink thickened in the nozzle that causes the clogging, or contaminant plugging of the nozzle*).

Takeshi et al. does not discloses a cover plate spaced from said ink expulsion mechanism and having a nozzle therein, said nozzle being aligned with said ink expulsion mechanism.

Bares et al. discloses a top-shooting thermal inkjet printhead having a nozzle (*FIG. 5, element 17*) formed in a member opposing an ink expulsion mechanism (*FIG. 5, element 11*), a barrier layer (*FIG. 5, element 12*) formed on a substrate (*FIG. 5, element 15*), a cover plate (*FIG. 5, element 16*) having a nozzle therein formed on said barrier layer and positioned such that said nozzle is aligned with said ink expulsion mechanism, said substrate, barrier and cover plate defining an ink well (*FIG. 5, element 14*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to replace the side-shooting printhead structure disclosed by Naoki et al., as modified, by the top-shooting printhead structure including the barrier layer, the cover plate comprising the nozzle opposed and aligned with the ink expulsion mechanism as disclosed by Bares et al. since both structures are well known in the art as alternative common technique for designing a thermal ink jet printhead.

**Takeshi et al. also discloses the following claimed invention:**

**Referring to claims 16, 33:** wherein said sensor mechanism includes logic that is capable of determining a magnitude and timing of a pressure wave generated by a firing of said ink expulsion mechanism, wherein said pressure wave of said first non-zero magnitude occurs at a first time delay, and wherein said sensor mechanism is capable of detecting a pressure wave that occurs at a second time delay different from said first time delay that is indicative of when said nozzle is unclogged. (FIG. 5-7).

4. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naoki (JP 11129472) in view of Mansky et al. (US 6438497) and Mochuzuki et al. (US 5003213).

Naoki et al., as modified by Mansky et al., discloses the claimed invention as discussed in the first rejection except wherein the first sensor and the second sensor are provided in a substantially orthogonal arrangement on said substrate.

Mochuzuki et al. discloses a surface acoustic wave detector having at least two interdigitated sensors that are provided in a substantially orthogonal arrangement on a substrate (FIG. 2-3, elements 12-1, 12-2, and 14).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify arrangement of the interdigitated sensors disclosed by Naoki et al., as modified, so the interdigitated sensors are orthogonal to each other as disclosed by Mochuzuki et al. The motivation for doing so would have been to be able to detect pressure acoustic wave from multiple directions as well known in the art.

5. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Naoki (JP 11129472) in view of Mansky et al. (US 6438497), as applied to claim 24, and further in view of Mochuzuki et al. (US 5003213).

Naoki et al., as modified by Mansky et al., discloses the claimed invention as discussed in the first rejection except wherein the second sensor is orthogonal to said predetermined direction of the first sensor.

Mochuzuki et al. discloses a surface acoustic wave detector having at least two interdigitated sensors that are provided in a substantially orthogonal arrangement on a substrate (*FIG. 2-3, elements 12-1, 12-2, and 14*).

Therefore, it would have been obvious for one having ordinary skill in the art at the time invention was made to modify arrangement of the interdigitated sensors disclosed by Naoki et al., as modified, so the interdigitated sensors are orthogonal to each other as disclosed by Mochuzuki et al. The motivation for doing so would have been to be able to detect pressure acoustic wave from multiple directions as well known in the art.

#### ***Response to Arguments***

Applicant's arguments filed on 01/24/2005 with respect to claim 23 have been considered but are moot in view of the new ground(s) of rejection.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S. NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D. MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN  
10/15/2005

*Hai Pham*  
HAI PHAM  
PRIMARY EXAMINER